

DOCUMENT RESUME

ED 325 479

TM 015 630

AUTHOR Baghi, Heibatollah; Ferrara, Steven F.
TITLE Detecting Differential Item Functioning Using IRT and Mantel-Haenszel Techniques: Implementing Procedures and Comparing Results.
PUB DATE Feb 90
NOTE 35p.; Paper presented at the Annual Meeting of the Eastern Educational Research Association (Clearwater, FL, February 14-17, 1990).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Chi Square; Comparative Analysis; Correlation; Grade 9; *High School Freshmen; High Schools; *Item Bias; Item Response Theory; Testing Problems; *Test Items; Test Reliability
IDENTIFIERS *Mantel Haenszel Procedure; *Maryland Test of Citizenship Skills; Three Parameter Model

ABSTRACT

Two techniques for detecting differential item functioning (DIF) of test items are compared: (1) item response theory (IRT), using the three-parameter model; and (2) Mantel-Haenszel chi square techniques (MHCS). The steps necessary for identifying differentially functioning items are identified for both approaches. Using data from the 1988 Maryland Test of Citizenship Skills (MTCS), the following parameters were investigated: (1) the stability of the MHCS statistic across sample sizes; (2) the stability of the DIF index (MH Alpha) in the MHCS approach across several score groups; (3) the correlation between IRT DIF indices and MH Alpha; and (4) agreement between the IRT and MHCS techniques in identifying biased items. The MTCS was administered to about 50,000 ninth-graders in January and February of 1988. For IRT purposes, random comparison groups of 1,000 students each were created, while the MHCS procedure used samples of 1,000, 750, 500, and 200 examinees. The IRT DIF procedure identified four items in male/female comparisons and three items in white/black comparisons in the MTCS that have significant unequal probabilities of a correct response. While correlation results indicate that the two techniques disagree regarding item bias, agreement in terms of total hits indicates that the MHCS technique is an adequate substitute for the three-parameter IRT approach if the sample size is at least 750. In terms of the percentage of items identified as biased, the techniques appear to be equally good in detecting DIF. Five graphs and 11 tables present study data. A 35-item list of references is provided. (SLD)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED325479

Detecting Differential Item Functioning Using IRT and Mantel-Haenszel Techniques: Implementing Procedures and Comparing Results

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as
received from the person or organization
originating it.

☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

HEIBATOLLAH BAGHI

HEIBATOLLAH BAGHI
STEVEN F. FERRARA

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) "

DIVISION OF INSTRUCTION

Maryland State Department of Education
200 West Baltimore Street
Baltimore, Maryland 21201

Paper presented at the
Annual Conference of the
Eastern Educational Research Association

Clearwater, Florida
February 1990

TM 015630